

IX. *Observations on some undescribed or little-known Species of Hemiptera-Homoptera of the Family Membracidae.* By G. BOWDLER BUCKTON, F.R.S., F.L.S.

(Plates 21 & 22.)

Read 17th November, 1904.

THE efforts made during the last few years to systematize, in some natural manner, the Homopterous family of Membracidae have met with varying success. The somewhat numerous species have hitherto engaged less attention from the entomologist than they deserve, though they constitute a remarkable group, in which diversity of form suggests problems and theories on the effects of environment, and mimicry also, which will exercise the patience of the experimentalist and the acumen of the biologist. The little interest shown may partly be ascribed to the comparatively small size of some species, which necessitates an appeal to the microscope so as to reveal their chief characteristics; yet many entomological collections contain undescribed examples of these Hemiptera which will repay the investigation into their distribution and life-history, &c.

An examination of a few examples not hitherto described—or, at least, not adequately so for identification—constitutes an excuse for offering some notes to the Linnean Society.

Another cause of the entomologist's indifference may be the fact that very few representatives of the family are known as denizens of Europe. Species are mostly exotic to England, and are at present most numerous represented on the continents of North and South America. The European species typified by Linnæus in *Centrotus cornutus* and the American in *Membracis foliacea* by Fabricius, are now expanded into several subfamilies and numerous genera.

The significance of their remarkable forms and their dependence on environment, also on their protective and aggressive mimicry, have been discussed by Prof. Poulton. To him and to the Rev. Canon Fowler, both Fellows of our Society, I am indebted for information as to the economics of the species and their persistence throughout the struggle for life.

Where the man of science can frame a tenable hypothesis he often produces more valuable fruit than the compiler of facts, however unanswerable these may be; but the work of the resolver of what appears to be a confusion into a consistent order has its value. On this footing I offer to the Linnean Society the present contribution. It is advanced as tentative, and must be so until our knowledge of the life-history of Membracidae shall add to the bare facts now alone at our disposal.

The recently published memoirs by W. W. Fowler, in the 'Biologia Centrali-Americana' of Godman and Salvin*, and my 'Monograph of the Membracidae' †, may be consulted

* Biol. Centr.-Amer., Rhynch.-Homop. (W. W. Fowler), vol. ii. (1894).

† Mon. Membracidae (Buckton) (1903).

as to related genera. In the last work an attempt has been made to classify the family as it is at present known.

The 'Biologia' above alluded to of course only deals with the American insects. Prof. Ign. Bolivar has obligingly forwarded to the writer specimens from the Musée d'Histoire Naturelle de Madrid, and the writer has also received examples of unnamed species from the Musée Belgique. These form the subjects of the present memoir.

RHYNCHOTA-HOMOPTERA.

MEMBRACIS MICANS, sp. n. (Plate 21. fig. 1.)

Pronotum foliate and flattened laterally; metopidium rising perpendicularly above the eyes. Colour pale stramineous, shining like mica, with a pale brown fascia reaching from each shoulder to the thin upper edge, succeeded by two other interrupted fasciæ, the latter carried to the posterior end. Legs pale ochreous; fore legs slightly spatulate with brown claws. Tegmina hyaline with yellow neuration. Twelve specimens at my disposal were pretty constant in their colouring.

From the Belgian Museum. Collected by M. Van Voixem. Size 9×6 millimetres.

MEMBRACIS VERGENS, sp. n. (Plate 21. fig. 2.)

Rather large. Colour a dull coal-black. Seen in profile, with a bright ochreous band which extends backwards from above the eyes on the metopidium to the dorsal edge; this forms a waving stripe on a black ground. Metopidium rather overhangs the head. Legs black and slightly spatulate.

Hab. Sta. Caterina.

Coll. Camilie, Van Voixem. Size 12×6 millimetres.

HAMMA NODOSUM* (genus et species nov.). (Plate 21. fig. 3.)

Pronotum turgid and prolonged into a knot-like sinuous process, furnished with numerous small spines. This serpentine appendage is continued free from the dorsum, and is nearly as long as the tegmina. These last are short, each furnished with a broad corrugated limb and with a brown coarse neuration. Metopidium high and crested.

H. nodosa is of a concolorous shining coal-black. The tegmina are ochreous and diaphanous at the tips. Legs black, except the hind pair, which are rufous. The posterior process is contorted into segmental knots.

Hab. The Kamerons, W. Africa. Size 4×2 millimetres.

Allied to *Sphongophorus*.

MICROSHEMA MUCRONATA, sp. n. (Plate 21. fig. 4.)

Larger. Pronotum rising perpendicularly from the frons into a pointed dorsal process, obtuse in the outline and continued as a straight line to the sharp posterior apex. Suprahumerals rather short and divergent. Colour bright red, with punctured dots.

* Ἄμμα, a knot.

The upper edge of pronotum broadly black at the summit, which shade is continued as a black line nearly to the apex of the tegmen. The tegmina ample and pointed at the tips, with a broad limbal edge and of a fine purple-brown colour, too dense to show the neuration. Frons pale sordid brown. Legs rather spatulate. Size 15×6 millimetres.

Musée de Madrid.

ACONOPHORA OBFUSCATA, sp. n. (Plate 21. fig. 5.)

Pronotum porrect, or projected forwards as a flat sharp horn, laminated at the edges. Colour dark fuscous and mottled. Pronotum carried to the posterior end, which terminates in a point nearly reaching to the tips of the tegmina. Legs rather long, with yellow tibiae. Tegmina pale ochreous with a fuscous neuration.

This insect is somewhat like *A. flavipes*, but it is not so large and the given locality differs also.

Hab. Mexico. Size 11×4 millimetres.

TRAGOPA TRIANGULATA. (Plate 21. fig. 6.)

Small. General aspect scutiform. Pronotum, viewed from the dorsal aspect, trapezoidal or four-sided. Tegmina short, much corrugated, and difficult to separate from the abdomen. Suprahumerals hardly visible, but by the frontal aspect rather auriculate, suggesting some affinity to *Chelyoida* *. Eyes large and prominent. Legs short and robust. Colour sordid ochreous, with dark fuscous on the thorax and on the abdomen. Size 4×4 millimetres.

Musée de Madrid.

POPPEA SUCCINEA, sp. n. (Plate 21. fig. 7.)

Pale amber-yellow, rather transparent. Pronotum raised into bulbous tubercles, the posterior bulb of which forms two stout processes, somewhat similar to the suprahumeral horns. Eyes prominent. Tegmina hyaline, glistening, but corrugated, and with a broad limbus. The suprahumeral are divergent and united between the shoulders to a button-like scutellum, which joins the tuberculous dorsum.

This insect has a considerable resemblance to *Poppea concinna* †, but is larger and has more robust suprahumeral.

Hab. Mexico. Size 9×3 millimetres.

Musée de Madrid.

ELECTROPHINA PACIFICATA (genus et species nov.). (Plate 21. fig. 8.)

Has some of the characters of a *Ceresa*, particularly in the neuration of the tegmina, which are remarkable for their length, viz. about twice that of the body, and also by the occurrence of conspicuous suprahumeral horns. These are barely visible in *Ceresa*.

* Mon. Membracidae, pl. 33. fig. 2, p. 156.

† See Mon. Membracidae, pl. 34. fig. 5.

Electrophina pacificata is a relatively large insect, almost concolorous yellow, with the pronotum slightly inflated and punctured. It is not laminated, or flat, as in *Ceresa*. A dull fuscous patch over the metopidium, a transverse stain on the pronotum, and a fuscous tint at the posterior horn, are the sole variegations of the yellow colour of the insect. The horn is free above the large abdomen. The tegmina show ovoid membranous cells which are bounded by pale fuscous nervures. Legs moderate in length and brown.

Hab. Coll. de Pacifico. Size 13×5 millimetres.

Musée de Madrid.

CERESA NITENS, sp. n. (Plate 21. fig. 9.)

Pronotum arcuate and flat, and ending in a sharp point. Abdomen large and ringed. Metopidium, when seen from the front, high and furnished with short supra-humerals. Legs short. Surface very shining, like corrugated talc; colour sienna-yellow or of an amber hue. Pronotum marked by a conspicuous brown or black transverse fascia. Tegmina slightly ferruginous, but with clear membranes. Legs ferruginous brown.

Hab. Chiriqui. Size 9×5 millimetres.

Musée de Madrid.

ENTYLIA MESTA, sp. n. (Plate 21. fig. 11.)

Small. Metopidium, as seen from the front, rising into a pointed and punctured prominence, which appears broad and truncated by the profile view. Pronotum rises behind into a hump, which falls off to the posterior apex. Colour dingy ferruginous, with a pale carina on the procephalon and two other streaks down the hump. Tegmina short, with grey patches on the shoulders and corrugated grey on the tips. Legs stout.

Hab. Mexico. Size 5×3 millimetres.

Musée de Madrid.

ENTYLIA FUSCODORSA, sp. n. (Plate 21. fig. 10.)

Larger than the last insect. The procephalon smaller and less truncated. Colour pale greenish yellow. Tegmina with deep punctures and brownish blotches between the venations, and with still larger blotches below the pronotal horn. The lower margin of the pronotum notched where it joins the metopidium. The dorsal hump is often, but not invariably, ferruginous brown. Tegmina olive-grey. Legs ferruginous. Size 6×4 millimetres.

HYP SAUCHENIA JUGULATA, sp. n. (Plate 21. fig. 12.)

Dorsum with a yellow patch between the procephalic horn and the dorsal prominence. The long curved cephalic process has a yellow line on each side, which runs from the eye

to the summit. The fore legs obscurely spatulate, the other legs yellow. The general colour of the insect brownish black, more or less covered with a fine corrugated punctuation.

The species hitherto described are distributed over several islands of the Indian Ocean and the Philippines, but this is the first record of their occurrence in Sumatra.

Hab. Sumatra. Size 8×9 millimetres.

Musée de Madrid.

OURANORTHUS PALUS* (genus et species nov.). (Plate 22. fig. 1.)

Although this somewhat singular insect does not strictly conform to the diagnosis given by Fairmaire for his genus *Lamproptera*, I think provisionally it may be placed under that classification. The erect horn in the dorsum is single, not seen as "cornubus duobus," and is inserted at a right angle just above apex of the abdomen. Lanceolate in form, it is neither carinated nor glabrous. The metopidium rises above the eyes into a tumid hump, and then it proceeds nearly straight to the apex. Legs stout and slightly spatulate. Frons furnished with two short recurved suprahumeral. The colour fine yellow and the surface devoid of hairs. Tegmina yellow, with orange-coloured nervures.

Hab. Bangalore, India. Size 8×5 millimetres.

Musée de Madrid.

KLEIDOS PALMATUS, sp. n.

Tegmina sombre brown, but inclining to red at the tips. Posterior horn vomerate or like a plough-share, with fine serrations on the lower edge. A slight tubercle occurs above the geniculate angle of the horn. In other respects it resembles *Kleidos vomeris* (figured in Mon. of the Membracidæ, pl. xlvi. fig. 2) and is the second example of that genus.

Hab. Zanzibar. Size 9×6 millimetres.

Kleidos vomeris occurs in Ceylon.

ANCHON STRIGATUM, sp. n. (Plate 22. fig. 3.)

Procephalon conical, with the summit divaricate or split into two leaves, which the insect appears to be able to close and open at will. The base of the cone has a white line which runs to the top of the same. Posterior horn ulnate and tapers to the end, without any dilation. There are no suprahumeral, or they may be represented only by obtuse points. Tegmina bright and of a shining yellow, but corrugated and stained with fuscous on the limbus, a spot on the costa, and a patch on the inferior edge. Tibiæ yellow. Size 9×6 millimetres.

This insect recalls *Anchon albolineatum*, but it is distinct.

Hab. Cameroons, W. Africa.

*-οὐρά, tail; ἀνορθόω, I erect.

ANCHON FUSCUM, sp. n. (Plate 22. fig. 2.)

Concolorous light brown, except at the tips of the tegmina, which are darker, and fuliginous near to the costa, and the legs obscurely ferruginous. The procephalon is without suprahumeral and the summit is divaricate, as in the last species. Posterior horn uhnate and sinuous. Size 7×5 millimetres.

Hab. Cameroons, W. Africa.

*TALOIPA TINCTORIA** (genus et species nov.). (Plate 22. fig. 4.)

Small, robust. Concolorous black, except the tegmina. Suprahumeral short and square to the frons and to the metopidium. The posterior horn of the pronotum very short, and not equal to half the tegmen. Frons and face hirsute. Tegmina ochreous, but diaphanous, corrugated with a brown neuration. The base stained with a red suffused fascia, giving the wings a mottled tint.

Hab. Manila, Philippines; Bangalore. Size 7×4 millimetres.

This insect has mixed characters of *Centrotus* and *Otinotus*, &c.

LEUCOTHORAX VILLOSA (genus et species nov.). (Plate 22. fig. 5.)

Large, robust. Posterior horn simple, but rather curved and shorter than the tegmina. Suprahumeral acute by the profile view, but truncated by the dorsal aspect. Colour dark shining brown, furnished with a broad white villous space on the thorax and at the wing-insertion. Two white spots on the dorsum. Legs strong, black, with yellow at the tips of the tibiae and the tarsi. Membranes of the tegmina corrugated and shining, but the neuration is obscure.

This is a striking species, partly from its diverging horns and tomentose coating.

Hab. Cameroons. Size 12×6 millimetres.

Musée de Madrid.

LEPTOCENTRUS IMPUNCTUS, sp. n. (Plate 22. fig. 6.)

Suprahumeral stout and recurved. Procephalic horn rather short, cylindrical, and distant from the abdomen. General colour dark brown, shining, with a tendency to show a white pilose spot on the pronotum. Tegmina long, with warm ferruginous and brown corrugations and nervures.

In the Madrid Museum there are several specimens of this species, which show slightly different sizes and also colouring, but they may be considered as identical.

Hab. Padautsin (?). Size 10×5 millimetres.

IBICEPS RUFIPENNIS, sp. n. (Plate 22. fig. 8.)

Colour dark brown, nearly black. Metopidium rather high, with erect suprahumeral and a free cylindrical posterior horn which is longer than the abdomen. The tegmina brown, with a broad rufous or yellow spot occupying the apical area. This spot is more

* τὰ λοιπὰ, the residue.

obvious in some examples than in others. There is also a greyish sheen spread over the basal portions of the wings.

Hab. Cameroons. Size 8×4 millimetres.

OPHICENTRUS SERPENTARIUS, sp. n. (Plate 22. fig. 7.)

This species is characterized in great part by the sinuous form of the posterior process or horn. Although the examples given by Canon Fowler in the Biol. Centr.-Amer. are all American, this species from Africa and from Tasmania has its significance.

Colour dark brown, showing a slight grey pubescence. Metopidium high. Posterior horn stout, much gnarled and bent into a tapering curve shorter than the tegmina, which last are warm reddish fuscous with dark neuration and a corrugated limbus. Legs stout. Abdomen and the rest of the body dark brown.

Hab. Cameroons. Size 8×4 millimetres.

Musée de Madrid.

There are other smaller specimens in the same Museum which have broad fuscous bands on the tegmina, and these as varieties may be designated *Ophicentrus minor* var., from the Cameroons.

POLOCENTRUS LABATUS, sp. n. (Plate 22. fig. 10.)

This genus is characterized by the clavate apex of the posterior horn, which is serrated below the clubbed extremity. The suprahumeral is short and obtuse by the profile aspect. Colour ochreous-orange, mottled with fuscous. Frons square and brown. Legs stout, flat, with yellow tibiae. Tegmina with yellow cellules and with broad brown nervures.

The usual habitat of the genus appears to be Southern India, but this species is from Abyssinia.

Musée de Madrid. Size 8×4 millimetres.

POLOCENTRUS CAUDATUS, sp. n. (Plate 22. fig. 9.)

Suprahumeral shorter and more erect than in *P. lobatus*, and the tegmina not brocaded with brown but diaphanous. Colour uniformly bright ochreous yellow. Legs flattened and almost spatulate. The clavate apex of the posterior horn is large and serrated on the lower margin.

Hab. Natal. Size 8×5 millimetres.

TRAPEZOIDA HIRSUTA (genus et species nov.). (Plate 22. fig. 11.)

The pronotum quite covers the scutellum and is domed in outline when seen from the side, but it has a somewhat four-sided outline from the dorsal aspect. The tegmina ample, broad, and longer than the posterior horn. Metopidium square, with short suprahumeral.

Frons covered with hairs. Eyes prominent. Legs with black femora and yellow-fringed tibiae. Colour uniformly dark fuscous, but with a yellow carina on each of the

suprahumerals and two wide yellow fasciæ across the dorsum, leaving the apex black. The tegmina are dense and do not readily show the neuration.

Hab. Central America. Size 7×4 millimetres.

Musée de Madrid.

Perhaps this insect might be included in the original genus *Centrotus*; yet it differs from Linnæus's typical *Centrotus cornutus*, which has been retained for reasons set forth in my 'Monograph of the Membracidæ,' p. 245.

There is no waste in the products of animal life, and it is a fact familiar to all observers that the effete excretion of one animal is often the food for another lower in the biological scale. The sweet secretions from many Homoptera are much sought for by ants and by the members of some insect families separate from them both in habit and classification. Thus we have Aphidæ, Cercopidæ, Fulgoridæ, and Membracidæ all laid under contribution for the pleasure or nourishment of different orders of insects. Whilst in the Aphidæ we find at least two discharging orifices or nectaries for such excreta, Mr. E. Green has shown that in *Centrotus nectaris* of Ceylon the larvæ have but one duct, which is capable of extension like the tube of some telescopes.

The larvæ of another species are common at the Cape of Good Hope, probably belonging to the genus *Oxyrhachis*, which carry their single nectary erect from the apex of the abdomen. They also are visited by ants. Although the winged insect has not yet been ascertained, a figure of this curious larva or pupa may be added to the singular forms which represent the pupal and immature stages of the Membracidæ.

It may be remarked that these pupæ are incapable of flight, yet they have the rudiments of the tegmina much developed, and that they are very active in their movements. They possess eyes and antennæ.

Future observation will show, indeed, whether they are pupæ or only arrested imagoes.

Pupa. (Plate 22. fig. 12.)

Robust. Colour wholly black, except the eyes, which are large, prominent, and sordid ochreous. Metopidium continued into a single sharp and erect horn which slopes nearly straightly to the apex of the abdomen, where it rises into an erect coriaceous and conical nectary, wide at its base and tapering to its summit. This is perforated and forms the nectary or duct for ejaulation, just as in *Aphis*.

The wing-cases or rudimentary tegmina are short, pointed, and black, with traces of an obscure neuration. Legs very stout, rather flat, with coarse tarsi. Size 5×3 millimetres.

These pupæ are probably the immature forms of an *Oxyrhachis* which develops simultaneously in the month of January, at Wynberg, a suburb of Cape Town, Africa.

The fact that these pupæ have only a single horn above the metopidium, instead of the double horn of *Oxyrhachis*, need present no difficulty when we consider the extraordinary shapes often assumed by certain insect organs which are not really homologues, though they may appear to be such. The legs of a larva need not be necessarily those of the corresponding imago which emerges from it.

EXPLANATION OF THE PLATES.

PLATE 21.

- Fig. 1. *Membracis micans*. The imago has a glistening and talc-like surface. Size 9×6 millimetres.
- Fig. 2. *Membracis vergens*. A large species remarkable for its dark hue and its broad ochreous streak. Size 12×6 millimetres.
- Fig. 3. *Hamma nodosa*. Small, pronotum rugose and contorted into knots.
- 3 a. The frons and metopidium. The sides are furnished with small spines. Size 4×2 millimetres.
- Fig. 4. *Microschema mucronata*. Large, remarkable for its bright colour, and sharp apex to the dorsal edge of the pronotum.
- 4 a. Frontal view of the frons and stemmata. Size 12×15 millimetres.
- Fig. 5. *Aconophora obfuscata*. The imago shows a broad foliated summit of the procephalon.
- 5 a. Front aspect of the procephalon as seen on edge. Size 11×4 millimetres.
- Fig. 6. *Tragopa triangulata*. Small and robust in figure. The pronotum does not reach beyond one-half of the tegmina.
- 6 a. Dorsal view. The pronotum forms an irregular triangle. The head is below the metopidium, which last has two lateral ear-like processes. Size 4×4 millimetres.
- Fig. 7. *Pappea succinea*. This semitransparent insect has the pronotum more or less inflated into coriaceous bubbles which have acute points. Tegmina hyaline and blistered on the surface.
- 7 a. The dorsal aspect of the insect. Size 9×3 millimetres.
- Fig. 8. *Electrophina pacificata*. The long wings and the extended suprahumeral horns are distinctive.
- 8 a. Frons and metopidium with horns. Size 13×5 millimetres.
- Fig. 9. *Ceresa nitens*. Very glistening, amber-coloured, robust.
- 9 a. Front view of same insect, with its high metopidium and short suprahumeral. Size 9×5 millimetres.
- Fig. 10. *Entylia fascodorsa*. Imago with truncated summit of the pronotum, punctured with fine dots within the sculptured carinæ. Size 6×4 millimetres.
- Fig. 11. *Entylia mæsta*. Imago small, with greyish pubescence.
- 11 a. Front aspect of the same showing the thin edge of the procephalon. Size 5×3 millimetres.
- Fig. 12. *Hypsauchemia jugulata*. This specimen from Sumatra has lost the summit of its procephalon which, probably like the Indian species, was curved over the back. Size 8×9 millimetres.

PLATE 22.

- Fig. 1. *Ouranorthus palus*. The winged insect is remarkable for the erect process proceeding from the caudal apex of the pronotum. Though allied, it certainly is not *Lamproptera caprealus* of Fairmaire.
- 1 a. The head, pronotum, and recurved suprahumeral horns of the same insect. Size 8×5 millimetres.
- Fig. 2. *Anchon fuscum*. Allied to *A. albolineatum*, but it wants the white streak on the pronotum.
- 2 a. The front aspect clearly shows that the procephalon is cleft into broad plates or foliations. The insect is bright amber-coloured. Size 7×5 millimetres.

- Fig. 3. *Anchou strigatum*. The dorsal process is here free and ulnate. The procephalic point probably is cleft like that of the last-named species. Size 9×6 millimetres.
- Fig. 4. *Taloiipa tinctoria*. The pronotum here is obtuse, and it ends posteriorly in a blunt process shorter than the abdomen. The bright orange colour on the base of the tegmina may be noticed.
- 4 a. The hirsute frons with the square metopidium. Size 7×4 millimetres.
- Fig. 5. *Leucothorax villosa*. Large, with truncated but short dorsal processes. The chest has a white villous coat.
- 5 a. The dorsal view of the pronotum.
- 5 b. The frontal aspect of the insect. Size 12×6 millimetres.
- Fig. 6. *Leptocentrus impunctus*. Remarkable for its long tegmina.
- 6 a. The head and frons.
- 6 b. The venation of the tegmen of the same. Size 10×5 millimetres.
- Fig. 7. *Ophicentrus serpentarius*. The undulating form of the dorsal process has been used generically by Canon Fowler, and I do so tentatively, whilst the immediate cause of variation in secondary organs is *sub judice*.
- 7 a. Frontal view of the insect. Size 8×4 millimetres.
- Fig. 8. *Ibiceps rufipennis*. The Imago. Bright shining, warm brown. The grey on the tegmina as shown by this figure is only meant to represent the light glancing on the corrugations of the wing, and it is not due to any patches of grey colour. Its long pronotal horn is smooth, instead of rough as represented on the Plate.
- 8 a. The head and front view of the pronotum. Size 8×4 millimetres.
- Fig. 9. *Polocentrus caudatus*. The winged insect is somewhat remarkable from its short posterior horn, which, like the rest of this genus, is serrated below. Legs spatulate.
- 9 a. Front view with the short suprahumeral. Size 8×5 millimetres.
- Fig. 10. *Polocentrus labatus*. This insect is from Abyssinia, and has the characteristic serrated posterior horn.
- 10 a. The front view with the dark frons and pointed suprahumeral.
- 10 b. The tegmen with its dark fuscous venation which encloses the chief ochreous cellules. Size 8×4 millimetres.
- Fig. 11. *Trapezoida hirsuta*. This insect from Central America has a square metopidium which is strongly hirsute. The dorsal view of the pronotum shows something of a lozenge shape.
- 11 a. Head and frons of the same.
- 11 b. Dorsal view of the insect. Size 7×4 millimetres.
- Fig. 12. Larva of a Membracid, not uncommon in the neighbourhood of Cape Town, and at Wynberg, S. Africa, but the winged insect has not yet been determined. The erect caudal nectary discharges a liquid, probably of a saccharine nature, and gives the insect a grotesque appearance. Probably it is visited by Ants, as is known to be the case with the larva of *Centrotus nectaris* of Ceylon. Size 5×3 millimetres.